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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Plant Introduction Newsletter No.4

Rome, May 1959

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FAO/59/5/3480

NOTES

1. These Newsletters represent informal communications addressed only to persons who are directly and actively interested in plant exploration, collection and introduction.

2. It is regretted that it is not possible to issue complete versions of these Newsletters in the three working languages of FAO - English, French and Spanish. As news items are, however, included in the original language the Newsletter is thus published in a trilingual form.

3. The earlier issues of this Newsletter contained reports of expeditions planned or in progress. It would be greatly appreciated if those concerned could send a report of these expeditions as soon as possible for inclusion in a later issue of the Newsletter.

4. All correspondence with regard to the above items should be addressed to the institutes or specialists concerned, or to: Dr. R.O. Whyte, Chief, Crop Production and Improvement Branch, FAO, Rome, Italy. Those wishing to be included on the mailing list for further issues of these Newsletters are requested to inform the above if they have not already done so.

FAO/59/5/3480

60. FAO: 4th Inter-American Meeting on Livestock Production

This meeting was held in Kingston, Jamaica, Federation of West Indies, from 22 July to 1 August 1958, and the best attended and most active section was that dealing with the Development of Grazing and Fodder Resources. Much was said about the adaptability of indigenous and exotic grasses and legumes in the countries of Latin America, particularly with regard to the tropical regions.

At the conclusion of the discussion on the tropical regions of the Western Hemisphere, the Technical Secretary, Dr. R.O. Whyte, referred to the somewhat exaggerated attention which is being given to Pangola grass. Since it appears that the very extensive areas of this grass which have now been established in Florida, the Caribbean islands and Central and South America may all be descended by vegetative reproduction from an initial introduction of some three to five plants into Florida about 1940, there is a great danger that an attack by insect pests or fungous diseases may seriously affect the growth of these pastures and the livestock industries based on them. Evidence of serious attacks by aphids and army worms were reported from Florida, Cuba and elsewhere. It would be highly desirable to continue to give attention to the other important pasture grasses of the region and at the same time to take the necessary steps to widen the genetical basis of the material of Pangola in the Western Hemisphere by new introductions from the original habitats in the African continent, where it is understood a wide polymorphous range of types is available.

The delegation of the United Kingdom (Trinidad) stated that, although Pangola may well be admirable for permanent pasture, it may be a mixed blessing in a system of rotational farming. In Trinidad several weeds appear to be able to compete successfully with Pangola; these are Paspalum fasciculatum, Mimosa pudica and Urena lobata. In Trinidad, the following grass species continue to be kept under observation as possible alternatives to Pangola: Toco grass (Ischaemum aristatum) (non-tainting varieties), Lucuntu grass (Ischaemum timorense), Guinea grass (Panicum maximum), elephant grass (Pennisetum purpureum) and Guatemala grass (Tripsacum laxum).

The delegation of the United Kingdom (Jamaica) quoted experience in the use of Pangola pastures which have been established on large areas in the sugar estates and private farms of the island. The weed problem is related to soils and management. A study of methods of eradicating Pangola in a system of rotation with other crops indicates that no difficulty should be experienced in this respect. The authorities are not overlooking the fact that a disease or pest may seriously affect Pangola grass in Jamaica. Exploration and collection of new varieties and strains of Digitaria decumbens are urgently needed. The introduction of Pangola in Jamaica has resulted in increased efficiency of management and utilization of pastures. Usually, the authorities advise farmers to use more than one species of grass for cattle production.

The report of this meeting will be available shortly in English and Spanish.

61. FAO: 4th Regional Conference for Asia and the Far East.

This Conference was held in Tokyo from 6 to 16 October 1958. Under the discussion of the World Seed Campaign, the Conference recognized that its success will depend largely on the initiative of countries individually or co-operatively. Among the four items covered in this recommendation, the Conference expressed its desire that FAO give more attention to work on plant introduction and exploration.

62. FAO/CCTA Technical Meeting on Legumes in Agriculture and Human Nutrition

This meeting was held in Bukavu, Belgian Congo, from 10 to 15 November 1958, and recommended to the Director-General of FAO and to the Secretary-General of CCTA/CSA that they invite the countries concerned to give high priority to increasing the total production of existing species of legumes already cultivated in Africa south of the Sahara. Among the aspects of fundamental research governments were invited to pursue and extend their studies of the natural flora with the object of obtaining additional species of legumes for use as fodder, shade plants, cover plants and green manure. The countries were also invited to continue their work on the improvement of legumes by purification and selection of local plant material by introduction and by hybridization. The object of selection should be of a quantitative nature, i.e. to obtain increased yields, or of a qualitative nature, i.e. to discover varieties (i) having a high food value and, particularly, a high content of proteins and vitamins, (ii) of recognised palatability. These objectives should be defined in accordance with indications provided by nutritionists and specialists in animal husbandry and, in respect of palatability, by means of tests conducted in such a manner that results may serve a statistical interpretation. The countries were further invited to conduct comparative tests of behaviour, within the framework of inter-African co-operation, by an exchange of purified varieties in the various ecological regions of Africa south of the Sahara.

It was also recommended that the governments concerned should form herbaria of leguminous species to be submitted for systematic botanical study and identification to recognised scientific institutions (Kew, Paris Museum, etc.) and to be maintained locally as reference herbaria; also to establish, in favourable ecological conditions, partial or complete collections of living specimens of legumes which could provide strains for selection, breeding, etc., taking appropriate steps to maintain the purity of the strains. It was recommended that the Director-General of FAO should envisage the publication of a world catalogue of leguminous species and cultivars which should be kept up to date by means of supplements, similar to the existing world catalogues of genetic stocks of rice and wheat. These species and cultivars should be referred, as far as concerns Africa south of the Sahara, to herbarium specimens, the collection of which is recommended above.

In view of the great importance of the study of rhizobial bacteria, the governments should be invited to give particular attention to the development of fundamental research in respect of the nutrition of legumes and of the factors affecting the development of their associated rhizobia. FAO should publish and keep up to date a world list of scientific institutes pursuing studies on rhizobia, and a catalogue of the strains that these institutes have available.

A report of this meeting will be available shortly in English and French.

Since quarantine is such an important aspect of plant introduction, CCTA presented to the above meeting the recommendation concerning grain legumes which had been adopted at the Third Annual Meeting of the Inter-African Phytosanitary Commission, held in London on 22 September 1958. The relevant legislation is quoted below:-

"CO-ORDINATED LEGISLATION

"The Inter-African Phytosanitary Commission considers that the requirements set out in the draft co-ordinated legislation are the minimum necessary to protect agriculture and forestry in Africa South of the Sahara and submits these proposals to Member Governments with the recommendation that they be implemented

as soon as possible. This co-ordinated legislation covers the movement of plant material from outside Africa South of the Sahara into this area but not between countries within this area, for which separate arrangements should be made by the Governments concerned.
"It is recommended that the Member Governments should report to the Commission at its next meeting the progress made.

"ACACIA spp.	
Vegetative material:	Prohibited.
Seeds:	Permit.
CLOVER (Trifolium spp.)	
Vegetative material:	Prohibited.
Seeds:	Phytosanitary certificate, treatment.
Fodder or meal:	Prohibited.
GROUNDNUT (and other Arachis spp.)	
Vegetative material:	Permit, phytosanitary certificate, special certificate (active growth), quarantine.
Seeds for planting:	Permit. Treatment of seeds originating from countries in which rusts of groundnut are known to occur.
Seeds for consumption:	Unrestricted.
LUCERNE (Medicago sativa)	
Vegetative material:	Prohibited.
Seeds:	Phytosanitary certificate, special certificate or additional certificate of active growth inspection for Crown Wart (Urophlyctis alfalfae), bacterial wilt (Corynebacterium insidiosum) and alfalfa dwarf or Pierce's disease virus.
Fodder and meal:	Prohibited.
PEAS AND RELATED PLANTS (Pisum spp., Lathyrus spp., Vicia spp.)	
Vegetative material:	Prohibited.
Seeds:	Unrestricted.
SOYA BEAN (Glycine soja)	
Vegetative material:	Prohibited.
Seeds:	Phytosanitary certificate and additional declaration that the region of origin was free from soybean cyst-forming nematode.

"Vegetative material and seeds
"The Commission recommends that the importation of vegetative material should not be authorised if the plant species or variety can be satisfactorily imported and propagated through seeds.

"Rooted plants
"The Commission recommends that the importation of rooted plants should not be authorised if unrooted cuttings, scions, butwood and seed could be equally satisfactorily used for propagation."

"LEGISLATION COORDONNEE
"La Commission Phytosanitaire Interafricaine estime que la réglementation suivante constitue le minimum nécessaire pour la protection de l'Agriculture et des exploitations forestières en Afrique au Sud du Sahara et présente ces propositions aux pays membres en leur demandant de les rendre exécutoires dès que possible.

"Cette législation coordonnée s'applique aux introductions, en Afrique au Sud du Sahara, de matériel végétal en provenance de territoires qui ne font pas partie de cette région. Elle ne concerne pas des mouvements de ce matériel à

l'intérieur de cette région. Pour ces derniers des réglementations séparées seront établies par les gouvernements intéressés.

"Il est recommandé aux gouvernements membres de rendre compte à la Commission progrès réalisés avant sa prochaine session.

"ACACIA spp.

Matériel végétatif:	Importation prohibée.
Semences:	Importation sous permis.

ARACHIDE (et autres Arachis spp.)

Matériel végétatif:	Permis, certificat phytosanitaire, certificat spécial d'inspection en cours de croissance, quarantaine.
Semences pour plantation:	Permis. Traitement des semences provenant de contrées où existe la rouille de l'arachide.
Graines pour la consommation:	Sans restriction.

LUZERNE (Medicago sativa)

Matériel végétatif:	Prohibition.
Semences:	Certificat phytosanitaire, certificat spécial d'inspection en cours de croissance - Crown Wart (Urophlyctis alfalfae), bacterial wilt (Corynebacterium insidiosum), alfalfa dwarf virus ou virus de la maladie de Pierce.
Fourrage:	Prohibition.

POIS ET LEGUMINEUSES VOISINES (Pisum spp., Lathyrus spp., Vicia spp.)

Matériel végétatif:	Prohibé.
Semences:	Sans restriction.
Graines de consommation:	Sans restriction.

SOJA (Glycine soja)

Matériel végétatif:	Prohibé.
Semences:	Certificat phytosanitaire, certificat spécial ou déclaration additionnelle établissant que la région d'origine n'a pas de nématode dangereux.

TREFFLES (Trifolium spp.)

Matériel végétatif:	Prohibé.
Semences:	Certificat phytosanitaire.
Fourrage et dérivés:	Prohibés.

"Matériel végétatif et semences

"La Commission recommande que l'importation de matériel végétatif ne soit autorisée que dans le cas où la variété de plante ne peut être introduite avec succès par les semences.

"Plantes enracinées

"La Commission recommande que l'introduction de plantes enracinées ne soit autorisée que si elles ne peuvent être remplacées par tout autre matériel de multiplication (boutures, bois de greffe, semences) avec autant de succès."

63. FAO: Technical Meeting on Cacao

The participants to the First FAO Technical Cacao Meeting held in Accra, Ghana, 8-15 February 1959, recognizing the desirability of promoting the collection of more genetic material of cacao, particularly from the native habitat, recommended that FAO organize small cacao collecting expeditions for specific purposes to areas in South and Central America where promising material is likely to occur.

Furthermore, noting the need for improvement and expansion of means of maintaining and distributing improved plant material, the assistance of FAO was requested for the establishment of regional, disease-free cacao germ-plasm collections with adequate facilities for distribution of propagating material, to serve groups of interested countries.

The report of this meeting will be available shortly in English, French and Spanish.

64. FAO: World Seed Campaign

In this Campaign, which is to culminate in the World Seed Year which will probably be designated as 1961, plant exploration, collection and introduction is given an important part. The following brief summary of the position appeared in the World Seed Campaign News No.3:-

"Crop production began when primitive man collected seeds of the wild grasses and other plants which he had been using as food, and sowed them on river flats after the retreat of the floods. Since these early days, man has continued this process until now the introduction of new seeds and plant material has become an essential part of any program of crop improvement and plant breeding. A fruitful basis for discussion between crop specialists might well be the theme: A plant is not without honour save in its own country, if by its own country is meant its centre of origin as a wild plant or a crop of primitive cultivation.

"The story of the peregrination of crop plants from country to country and continent to continent is a fascinating one. It introduces the fortuitous travels of seeds and plant material along the ancient caravan routes, in the ballast of ships, and the packing of merchandise, the bedding of slaves, the impedimenta of armies, and the simple bundles carried by pilgrims and monks. In more recent times, migrants from the Old World to the Americas, or to the various parts of the British Commonwealth, took along such of the crops, vegetables and fodder plants with which they were familiar in their own land. In due course, the New World made many important contributions to the cropping and eating habits of the Old.

"To appreciate the geographical basis of all this interchange, one must know about the centres of origin of cultivated plants worked out by the Russian scientist, N.I. Vavilov. There are about eight main centres located in China, India, Indo-Malaya, Central Asia, the Near East, the Mediterranean, Ethiopia, and in various parts of South and Central America. The theory is that all crop plants originated in one or other of these centres and spread to other parts of the world with the accidental or intentional collaboration of man.

"Wheat arose in the Near Eastern and Ethiopian centres; in its early days primitive types crossed with certain wild grasses and gave the crop its capacity to spread all over the world. Rice may be the oldest of food crops, and may have originated in India, with other primary or secondary centres in the Philippines and Africa. The origin of maize remains a mystery and a perennial subject for speculation, because we cannot find the wild ancestors of this crop plant. Two areas have been suggested as possible centres of origin and domestication: (1) the highlands of Peru, Bolivia and Ecuador, and (2) an area in southern Mexico and Central America. Maize spread to Europe after the return of Columbus to Spain.

"The tobacco plant is also a native of tropical America. The original wild ancestor is again not known, but this very ancient crop was first cultivated by the American Indians in connection with their religious rites. The plant had

spread over North America before the arrival of Columbus and was introduced into Europe as an ornamental and medicinal plant in 1556.

"Also from Latin America came the potato and the tomato. The latter is interesting in that, by the middle of the 18th century it was grown for food in Italy and other parts of Europe, but that it was unknown as a food plant in North America until long after. Hardly more than 100 years ago, it was generally thought in the United States of America to be poisonous.

"The vagabond wanderings of lucerne have been worked out thoroughly, following its double routes from its centre of origin in the north-western part of Iran, one along North Africa and through Spain to France and Western Europe generally, the other through the Balkans and Hungary and up the Danube valley into Germany. The two types are said to have met in Franconia to produce the hardy hybrid type of that name, which was the seed that Wendelin Grimm took with him when he emigrated to his new home in Minnesota in 1857.

"One could continue for a long time with such examples, bringing in the ships of the tin trade between Cornwall and the Mediterranean, or Captain Bligh of the Bounty, or the Malayan navigators who used to sail between the East Indies and Mauritius and Madagascar. But we must consider what all this means to modern crop improvement and the possibilities that exist for international collaboration on a global or regional basis.

"In the first place, the wild or primitive cultivated types of crop plants in and around a centre or origin generally have a wider genetical basis in terms of gene composition than the bred strains of lands in which these crops are now extensively cultivated. It is frequently necessary to go back to this original material to bring into the existing improved strains a character for resistance to a fungous disease or insect pest to which the strain has suddenly become exposed.

"Many countries have developed important sectors of their agriculture entirely or largely on the basis of introduced plants. An example is the live-stock industry of the Eastern United States, Australia and New Zealand. Again, the herbage plant breeders of such countries find that their existing plants are on a too narrow genetical basis, and they come back to the Mediterranean and Near East for wild material with more of the required characteristics; the original material of Phalaris tuberosa introduced into Australia, for example, had a range of maturity of only two days - new types from the Mediterranean region have a range of three and a half weeks, an important factor in extending the area of cultivation of a crop in a winter rainfall environment.

"Expeditions large and small are continuously on the road searching in faraway places for these wild and primitive prototypes. In some cases, this search has become urgent as some of the valuable types of grasses and legumes, for example, are being eradicated from the Near Eastern range lands by over-grazing, or by the inexorable advance of cultivation. The U.S. Department of Agriculture and C.S.I.R.O., Australia, have been most active in this field. For example, FAO and C.S.I.R.O. collaborated in 1954 in a plant collecting expedition around the Mediterranean, for wild types of herbage plants of interest both to Mediterranean countries and in the southern part of Australia.

"There is scope here for international collaboration, and for coordination of activities through FAO. Probably some twenty countries would be interested in obtaining new plant material from, say, that great mountain block represented by Eastern Turkey, Western Iran and Northern Iraq. Not all of them could afford to send an expedition on their own, but they might well be able and willing to collaborate in an expedition organized on an international basis.

"Finally, what is to be done with all these seed samples when they are brought to the receiving country? Again, U.S.A., Australia and certain other countries have something approaching the necessary ground space and facilities, although even these tend to be swamped by the proceeds of an average expedition, which may add up to 2,000 or 3,000 samples. Small countries cannot afford such facilities, nor can they contemplate establishing what have come to be called germ plasm banks. These may be field plots or they may be cold stores in which seed samples of important new lots or of the old local varieties of a crop may be stored for 10 years or more without losing their germination power.

"For all these multifarious activities regional collaboration is the answer. The plant breeders will not obtain the material they require unless something constructive is done in this direction.

"A more extensive review of this subject is available in FAO Agricultural Study No.41, "Plant Exploration, Collection and Introduction", by R.O. Whyte, to be published shortly."

(The World Seed Campaign News is available in English, French and Spanish).

65. FAO: Agricultural Study on "Agricultural and Horticultural Seeds"

This Study is in preparation as a major contribution to the World Seed Campaign by Crop Production and Improvement Branch. Particulars of its contents, which will include attention to plant introduction and related matters, may be obtained from FAO Headquarters.

66. FAO: Tabulated Information on Tropical and Sub-Tropical Grain Legumes

This publication, to which reference was made under item No.4, is ready for distribution.

67. FAO: List of National Plant Quarantine Services

An up-to-date list of national plant quarantine services was issued by Crop Protection Branch in January 1959, and a copy is being circulated with this Newsletter, together with a form for reporting any changes.

68. WMO: Regional Association IV (North and Central America)

The second session of this Association was held in Washington from 1 to 6 December 1958. Regional Association IV of WMO covers the area extending from the Caribbean through Canada. FAO was represented by Dr. Roy Dawson of the North American Regional Office. The meeting noted that little progress has been made on climatic atlases. The British Caribbean delegate suggested that monthly rainfall charts be expanded on a regional scale. It appeared particularly important to agree on a standard method of preparing charts, in order that they may eventually fit into a national or regional scheme. FAO's representative urged that attention be given to agricultural needs, and especially to the development of climatic atlases.

FAO Headquarters fully recognizes the basic importance of agroclimatological studies in the development of its work, particularly in Crop Production and Improvement Branch, and hopes that it will be possible to establish an inter-Agency project involving the collaboration of FAO, WMO and UNESCO.

69. U.K.: Plant mapping scheme

For some years there has been in operation, under the auspices of the Botanical Society, a scheme for mapping the distribution of flowering plants and ferns in the United Kingdom. It is still too early to say what the final return of this volunteer work will be, but the objective has been to obtain a uniform cover, if possible a list of at least 150 species from each of the 3,500 squares into which England, Wales, Scotland and Ireland have been sub-divided. It is the patterns of common species which can be expected to be most interesting. The areas of climatic extremes show this most clearly. The questions which will arise as a result of preparation of maps of distribution will be numerous, for example: Why are common species rare or absent in certain regions? Can the plants not set seed properly in the particular climate? Is the soil unsuitable for seedling growth? The speculation will be more profitable when the results of this survey are available in the form of an atlas in about two years' time. The atlas will contain maps of all plants except those in certain difficult genera about which data are so far insufficient. These critical groups will be the subject of a second volume.

(Summary of report in The Observer, London, 9 November 1958).

70. U.K.: The University, Reading

Professor A.H. Bunting, Professor of Agricultural Botany, has asked the assistance of FAO in the collection of seed of the following species of grasses and legumes from the Near East:-

Aegilops spp. All available. In particular he believes the following are to be found in Turkey, Syria, Iraq, Iran and Afghanistan:

Ae. crassa	Ae. juvenalis	Ae. variabilis
Ae. cylindrica	Ae. triuncialis	

In addition, Ae. umbellulata and Ae. speltoides should be found in Turkey, Syria, Iraq, Iran, while Ae. mutica, Ae. columnaris, Ae. bicornis Ae. longissima and Ae. caudata should occur in Syria and Turkey.

From all these countries, Professor Bunting would like material of:

Hordeum spontaneum	Pisum fulvum	Vicia faba (local races or varieties)
H. bulbosum	P. elatius	
H. hystrix	P. sativum (local races or varieties)	V. narbonensis

Any assistance which correspondents may be in a position to give will be greatly appreciated. Letters and correspondence should be addressed to FAO Headquarters in the first instance.

71. Germany: Method for testing disease resistance of the potato

D. Rothacker and M. Haussdörfer, of the Institut für Pflanzenzüchtung Gross-Lüsewitz der Deutschen Akademie der Landwirtschaftswissenschaften zu Berlin, have described a method of testing wild and primitive forms of potato for resistance to Streptomyces scabies. The method is based on

hydroponic culture of plants in glass cylinders under short-day conditions, whereby a rapid development of tubers is obtained. These tubers are infected in their young stage with a suspension of spores of the disease. Some 6 to 8 weeks after the beginning of the trial the degree of resistance can be graded in the different types. So far no types resistant to this disease have been found.

(ROTHACKER, D. and HAUSSDORFER, M. 1958. Eine Methode zur Prüfung von Wild- und Primitivkartoffeln auf ihr Verhalten gegenüber dem Kartoffelschorf, Streptomyces scabies (Thaxter) Waksman et Henrici. Der Züchter, Vol.28, No.5, pp.223-228.)

72. Tunisia: Collection of herbage species

The FAO Field Officer in Tunisia, Mr. Michel Thiault, is making collections of grasses and legumes which are indigenous to that country, and in certain cases has established plots for seed multiplication purposes. Later in 1959 he will be able to provide small samples of the following ecotypes:-

Tall fescue from Bon Ficha (rainfall 250-350 mm.)
" " " Grombalia (rainfall 450-500 mm.)
Dactylis glomerata var. maritima

Requests for seeds should be sent to FAO Headquarters.

73. Afrique au Sud du Sahara: Nouvelles variétés agrobotaniques de riz cultivés

Le Professeur Roland Portères donne la morphologie, les caractères et la répartition des nouvelles variétés agrobotaniques de riz cultivés Oryza sativa L. et O. glaberrima St.

(PORTERES, R. 1955. Nouvelles variétés agrobotaniques de Riz cultivés O. sativa L. et O. glaberrima St. Journal d'Agriculture Tropical et de Botanique Appliquée, Vol. 11, No.12, pp.573-599)

74. Union of South Africa: Seed of Sorghum almum for sale

The Chief of the Division of Crops and Pastures of the Department of Agriculture (Private Bag 124, Pretoria) informs FAO that 170 tons of Sorghum almum Government-certified seed is available for sale at the price of £75 per 2,000-lb. ton. The seed is from the 1954 harvest: germination 60-80%, purity 95-99%. Orders should be placed direct with the above Division.

(This Newsletter may bring to the attention of correspondents from time to time the availability of seed of agricultural interest advised to FAO by official services of experimental stations. FAO, however, cannot assume any responsibility for these items and recommends that full details be obtained direct.)

75. Israel: Discovery of wild emmer

Professor H.R. Oppenheimer has recently described the discovery by Aaron Aaronsohn fifty years ago of wild emmer and its importance in the study of the origin of cultivated wheats. While wild einkorn had been discovered in 1854 in Anatolia, the first isolated spikelets of wild emmer (Triticum dicoccoides (Körnicke) Schwf.) were collected in the following year by Th. Kotschy, a plant collector working for the Austrian emperor on the north-west slopes of Mt. Hermon, together with wild barley (Hordeum spontaneum Koch). It was not until 1873 that Körnicke recognized this as a wild wheat and published his first note on it in 1889. In 1906 the young botanist Aaronsohn found isolated specimens in a fissure of nummulitic rock at Rosh-Pinah, a Jewish colony in Eastern Galilee. Later he found this wild wheat again in Mt. Hermon up to 1,800 m. above sea level, with preference for the eastern slopes of the mountain and among hard, calcareous, dolomitic or basaltic rocks. Aaronsohn found wild emmer also in Transjordan and other experts found it in Iran, Iraq, Azerbeidjan, Transcaucasia, Armenia and the Cilician Taurus. While the Palestinian emmers sometimes reach a very large size, specimens from mountainous districts are often only a few decimetres high and have narrower ears, smaller spikelets and rather tender awns.

Vavilov considered that wild emmer of Anterior Asia was a side-line in the genesis of wheat without direct genetical connection with cultivated wheats. This conviction was strengthened by the preference of this wild wheat for rocky, sterile habitats, in marked contrast to the behaviour of cultivated wheats.

Oppenheimer states that this hypothesis now seems to have been abandoned. Archeologists have always maintained that the culture of wheat and barley originated in Anterior Asia, more precisely in Mesopotamia and other countries surrounding the Great Syrian Desert. Excavations on Jarmo clearly demonstrate that emmer was cultivated by prehistorical man in the neolithic period about 5,000 B.C. The spikelets of this emmer are partly dicoccum-like, but others look quite similar to the wild Triticum dicoccoides. This is interpreted by H. Helbaek (National Museum, Copenhagen) as a proof that at that time cultivated emmer developed by selection from its wild ancestor which had not yet disappeared from cultivation. "Thus modern science comes back to earlier, classical ideas concerning the origin of wheat, and we witness a reversion also in the appreciation of Aaronsohn's discovery." This has been confirmed by Professor Elisabeth Schiemann in her lecture to the German Botanical Society on the problem of the connection between wild emmer and cultivated wheat.

(OPPENHEIMER, H.R. 1957. Wild emmer - its discovery by A. Aaronsohn, fifty years ago, and its importance for the origin of cultivated wheats. Svensk Botanisk Tidskrift. Bd.51, H.3, pp.545-551)

76. Israel: Interspecific relationships in the genus Carthamus

This work has been done by Amram Ashri of the Faculty of Agriculture, the Hebrew University, Rehovot, under the guidance of Dr. P.F. Knowles. (See Newsletter item No.47). The genus is found around the Mediterranean Sea in Western Asia and in the Nile Valley. There are about twenty-five valid species, one of which is the cultivated safflower. In a study of eleven of these species it was found that there were two basic numbers in the genus X = 10 or 12. On the basis of chromosome numbers, four sections may be distinguished. The interspecific relationships in and between these sections, as well as the origin of several species, are discussed in the paper under review.

(ASHRI, Amram. 1958. Interspecific relationships in the genus Carthamus. Bulletin of the Research Council of Israel, Section D - Botany, Vol.6D, No.4, p.261)

77. Iran: Collections by FAO Field Officer, H. Pabot

Mr. H. Pabot and his Netherlands Associate Expert, Mr. J. van der Sprenkel, are now on an assignment to study the natural vegetation of the Zagros Mountains in relation to the soil wash and run-off to the irrigated land of the Khuzistan Project in the plains below. No doubt Mr. Pabot will at the same time follow his usual interests and collect seeds and other plant material of promising species. Any specialists interested in having ecotypes from this region should write to FAO Headquarters.

78. Afghanistan: Collection by FAO Field Officers, H. Pabot and J. del Perugia.

During his assignment in Afghanistan from March to November 1958, Mr. H. Pabot (see item No.42), in association with Mr. del Perugia, made a number of collections of herbage and fodder plants from the natural vegetation in Afghanistan, one of the important centres of origin for this group. Seeds and/or cuttings have been planted in plots at Kabul for multiplication purposes. The first despatch of seeds from Afghanistan to FAO Headquarters contained the following species:-

FAO No.		Location and height	Approximate climatic data: Rainfall	Av.temp. Jan.	Av.temp. July	Seed available
	LEGUMES		mm.	Cent.	Cent.	Grms.
6756	Trigonella griffithii	Shibar Pass 2700-3000 m.	500	-10	21	180
6757	Trigonella griffithii	" "	"	"	"	600
6758	Trigonella "gigantea"	Jaghouri, 2400 m.	400	- 7	22	60
6759	Onobrychis "camelorum"	" "	"	"	"	100
6760	Onobrychis "camelorum"	" "	"	"	"	150
6761	Onobrychis "cabulica"	Kabul 1900-2200 m.	300-350	- 4	24	40
6762	Onobrychis sp. ("cabulica"?)	Jaghouri 2400 m.	400	- 7	22	20
6763	Onobrychis "gigas"	Kalifgan, 1300 m.	400	- 1	26	15
6764	Psoralea drupacea	Col de Beili 1000 m.	120-400	-1/+3	26/30	120
6765	Onobrychis sp. (annual)	Shadian, 1800 m.	400	- 3	24	5
6766	Hedysarum sp.	Col de Beili 1300 m.	300	0	26	5
6767	Astragalus sp.	Col de Boka-Mazar, 2200 m.	450	- 5	23	Few seeds
6768	Astragalus sp.	Kalifgan, 1000 m.	350	0	26	5
	GRASSES					
6769	Aristida plumosa	East of Mazar 450 m.	150	1	30	15
6770	" "	Helmand Valley 600 m.	100	8	33	15
6771	Pappophorum persicum	Kalifgan 1000 m.	350	0	26	10
6772	Andropogon ischaemum	Kalifgan 1300 m.	400	- 1	26	10
6773	Chrysopogon ciliolatus	W. of Kandahar 1000 m.	130	6.5	32	Few seeds
6774	Cymbopogon laniger (?)	" "	"	"	"	5
6775	Stipa cf. barbata	Qalat, 1500 m.	220	1	28	10
6776	Stipa cf. barbata	Band-I-Amir 3000 m.	500	-10	20	Few seeds
6777	Stipa cf. barbata	Kalifgan, 1300 m.	400	- 1	26	Few seeds

			mm.	Cent.	Cent.	Grms
6778	Stipa cf. barbata	Gorbend Valley 1900 m.	300	- 3	24	Few seed
6779	" "	Shibar Pass 2900m.	500	-10	21	" "
6780	Stipa orientalis	Col de Boka-Mazar, 2200 m.	450	- 5	23	" "
6781	Festuca spadicea	Shibar Pass 2900 m.	500	-10	21	20
6782	Lasiagrostis (?)	Kalifgan 1300 m.	400	- 1	26	10
6783	Oryzopsis "montana"	Col de Boka-Mazar, 2300 m.	450	- 5	23	Few seed
6784	" "	Shibar Pass 2600 m.	450	- 9	22	" "
6785	Oryzopsis sp.	Shibar Pass 2900 m.	500	-10	21	" "
6786	Oryzopsis cf.holciformis	Kalifgan 1000 m.	350	0	26	" "
6787	" "	Gorbend Valley 1900m.	300	- 3	24	" "
6788	" "	Kalifgan 1300 m.	400	- 1	26	" "
6789	Bromus sp.	Col de Boka-Mazar 2300 m.	450	- 5	23	" "
6790	Elymus junceus	Panjao 2900 m.	500	-10	21	" "
6791	Elymus elatius	Shibar 2600 m.	Cool mountain sites			" "

79. Pakistan: Revision of the genus Indigofera L.

S.I. Ali, of the Department of Botany, D.J. Government Science College, Karachi, has undertaken a revision of types of this genus from Pakistan and the North-West Himalayas, and the following is a brief summary of his report:

The genus Indigofera L. consists of more than three hundred species, the centre of distribution being tropical Africa. Most of the species are perennial a few are annual. The genus is widely distributed in the tropics and sub-tropics of the New and Old Worlds. There exists no single work which would be used for this genus from the area under consideration. The works of Baker (1876), Boissier (1872; referable only to Baluchistan) and Prain (1897) are still indispensable. Later some of the regional floras have covered the account of the genus from Sind (Cooke, 1902, Punjab (Parker, 1924), Kumaun (Duthie, 1905, Osmaston, 1927) but there exist no such works for Kashmir, N.W.F. Province and Baluchistan.

An attempt has been made to revise the genus from the area under consideration. In all, twenty-six species have been recognized, thereby showing an increase of five species as compared to the number of species recognized by Baker (1876) and Boissier (1872). It includes two new species, two new varieti three new ranks or combinations, one new name and one new record from the area under consideration. The area under consideration consists of West Pakistan, Kashmir, East Punjab (India) and Kumaun (India). The following sub-divisions of the area have been recognized: Sind, Baluchistan, N.W.F. Province, Punjab (East and West), Kashmir and Kumaun (including Garhwal). The information about the flowering period of the taxa given in each case is referable to the plants from the area under consideration and may not be applicable elsewhere.

(ALI, S.I. 1958. Revision of the Genus Indigofera L. from West Pakistan and N.W. Himalayas. Botaniska Notiser, Vol.III, Fasc.3, p.543)

80. U.S.A.: Soybeans resistant to nematodes

Nematode-resistant soybeans have been found by screening approximately 3,000 individual selections and varieties in the U.S.D.A. world soybean collection. Four different lines of the soybean were found to show resistance to the soybean cyst nematode by limiting the nematode's reproduction and population build-up. Second-stage larvae in the roots of the resistant lines failed to mature. These experiments, carried out in the field in co-operation with the North Carolina Agricultural Experiment Station, mark some of the first steps of the development of nematode-resistant soybean varieties from breeding stock that is already available.

(The above is an extract from a letter dated 31 October 1958 received from Dr. Roy C. Dawson, Agricultural Officer, North American Regional Office of FAO).

81. U.S.A.: Co-ordination of action

"Someone has said that our modern civilization, at the threshold of the atomic age, is still content to sow and harvest the crop plants of the Stone Age. It does seem remarkable that of the thousands of species of higher plants known to science today, relatively speaking only a handful, mostly of ancient lineage, are the ones still widely cultivated as our major crops. That these particular plants have served mankind well is indicated by their ability to support a rapidly increasing population down through the centuries. Yet the origins of those plants are lost for the most part in prehistoric time. Compared to them a neophyte Para rubber tree (Hevea brasiliensis), a mere century-old in culture, is but a babe in agriculture's arms. ....

"Today there is still much to be desired in the line of a coordinated and concerted effort to discover new sources of utility in plants. Coordination is emphasized because much, indeed practically all of what we have learned in this field, has come by chance. ....

"One of the most rewarding areas in this field of more plants for man should lie in a systematic survey of the world's aboriginal plants. A team of ethnologists, botanists, and chemists would play cooperative parts. Such a survey should not be delayed for with civilization advancing as rapidly as it is, much of the vast stock of plant lore gathered by primitive tribes will soon be lost. ....

"Support for research in bringing together the tremendous backlog of isolated and scattered reports on new potentially economic plants and for their analysis or re-examination in relation to chemical constituents, is a field which offers great promise in the development of more plants for man. Already certain countries, for example Australia and India, recognizing the potential value of the work, have initiated comprehensive surveys of their economic species. Such surveys as have been made have yielded without exception something of economic importance even though often in a direction not expected from the objectives of the research. It is always difficult to comprehend why an industrial giant like the United States, so dependent for its well-being on the products of the green world, has until now failed to support adequately scientific research in this field.

"Administrators are accustomed to requests for the development of new varieties of economic plants to alleviate emergencies of one kind or another. The need is obvious. The necessities of war in respect to strategic plant material are likewise understandable, but the tremendous benefits that can be obtained from the objectives of basic research on new potentially useful species

seem to be difficult to comprehend. Now-a-days few would argue against the tremendous costs of atom-smashing equipment. Not so many years ago requests for such would have received scant public consideration. Research on the potential utility of the great bulk of the world's plant population is where atomic research was 25 years ago. It is hoped that botanical scientists in general and economic botanists in particular can be more articulate in describing the needs and benefits of this type of research in relation to its benefits to mankind. If the objectives are comprehensible, financial and administrative support eventually will be found."

(HODGE, W.H. 1958. More plants for man. Qualitas Plantarum et Materiae vegetabiles, Vol. 5, No.1-2, pp.154-157.)

82. Chile: Primer Seminario Latinoamericano Sobre Semillas

En este Seminar que se celebró en Chile, del 16 a 28 de enero de 1958, se discutieron los aspectos relacionados con la producción, distribución y control de semillas. El Seminario fué auspiciado conjuntamente por el Ministerio de Agricultura de Chile, la Administración de Cooperación Internacional (ICA), Washington D.C., y La Misión de Cooperación Técnica de los Estados Unidos en Chile. El siguiente comité estuvo a cargo de la introducción de semillas:

Presidente:	Humberto Gandarillas		Bolivia
Secretario:	Hugo Aguila . C.		Chile
Miembros:	J. Miguel Aspíllaga		Perú
	Raymond Cason	ICA	Honduras
	René Cortázar		Chile
	Benito Cuadrado		Chile
	Alvaro Montaldo		Chile
	Manuel Orellana		Chile
	Gregorio Rosemberg		Chile
	Ricardo Téllez	FAO	Chile
	Alejandro Violić		Chile

Las recomendaciones sobre este asunto son las que siguen:

1. Se recomienda que cada país mantenga colecciones de variedades que contengan los germoplasmas superiores de los principales cultivos para un posible intercambio de este material con el de otros países.

1.1 Que la responsabilidad del intercambio de este material sea entregada a una organización internacional.

2. Reconociendo las dificultades que encierra mantener y conservar en buen estado el material de propagación, se recomienda que cada Ministerio de Agricultura estudie la posibilidad de un tratamiento de aduana y cuarentena especial que a la vez que evita la diseminación de enfermedades e insectos, acelere el despacho del material genético.

3. Se recomienda que la organización internacional para el mejoramiento de los cultivos propuesta, coopere con las existentes tales como IIAA, FAO, y Fundación Rockefeller, en la colección e intercambio de este Material genético. Que, a la par que se protege la identidad y origen del material vegetal, se intensifique y mejore el intercambio de dicho material, especialmente aquel de fácil conservación, como semilla de trigo, arroz, maíz, cultivos forrajeros y otras especies.

4. Se sugiere que aquellos interesados en frutales, mantengan sus propias colecciones y realicen un registro de las mismas, dando las características de las variedades existentes actualmente en cada país. La circulación de esas listas facilitaría el intercambio de material entre los países.

5. Ya que existe especial interés en lo relacionado con papas, se recomienda que los países en que existen variedades autóctonas conserven su material hasta que una organización internacional pueda hacerse cargo de la mantención de estos germoplasmas.

Este informe ha sido publicado también en inglés.

83. Argentina: La vegetación de la Puna Argentina

"En el extremo noroeste de la República Argentina, entre las elevadas montañas de la Cordillera Real y los picos de la cadena Andina, se halla enclavado el altiplano o Puna. Se trata de una región muy agreste, semidesierta, de gran elevación sobre el mar y clima inclemente, pero a pesar de ello habitada por una flora y una fauna muy particulares, adaptadas a las grandes alturas, al frío y a la sequía, de enorme interés para el naturalista.

"A pesar de las condiciones de vida difíciles para el hombre, la Puna no sólo está poblada por indígenas desde tiempos muy antiguos, sino que por su situación geográfica, y sobre todo por su riqueza en yacimientos minerales, ha atraído al hombre civilizado."

"Plantas utiles de la Puna

"Numerosas plantas indígenas son utilizadas por los pobladores de la región de la Puna, unas veces en sus rudimentarias construcciones, otras como alimento o como medicina. Las más usadas son probablemente las que anoto a continuación.

"Plantas Industriales: En la construcción de viviendas se utiliza la madera de cardón (Trichocereus pasacana), que sirve para postes, vigas, puertas e incluso muebles. Para techar los ranchos se usa la paja de "guaia" (Deyeuxia fulva), "chillahua" (Festuca scirpifolia) y "badre" (Neosparton ephedroides). Como combustible sirven todas las especies lenosas, dándose cierta preferencia a la "tola" (Parastrephia lepidophylla) y especies afines. En los puntos muy elevados se utiliza como combustible la "yareta" (Azorella yareta) e incluso los troncos subterráneos de los "cuernos de cabra" (Adesmia div. sp.).

"Plantas comestibles: Muchas especies indígenas o adventicias se utilizan como complemento de la alimentación, sin que ninguna llegue a alcanzar importancia. Pueden citarse las siguientes: Juelia subterranea (alcañoca), balanoforácea parásita de las raíces de Parastrephia lepidophylla y otros arbustos, que puede ser comida, cocida o como verdura fresca (Cardenas, 1950; Cabrera, 1955); Rumex crispus, la "romaza" cuyas hojas se utilizan como verdura; Roripa nasturtium-aquaticum, el "berro de castilla", usado en ensalada; Amaranthus vulgatissimus, el "ataco silvestre", usado como verdura; Hoffmansegia gracilis y Hoffmansegia falcaria, con tubérculos comestibles; Hypsocharis tridentata, el "soldaque", cuyas gruesas raíces pueden comerse hervidas; Ipomoea minuta (culi-culi, culina) con raíces tuberosas comestibles, dulces; Mimulus glabratus y Mimulus laceratus, los "berros" de la Puna, comidos en ensalada; Tagetes andina, el "suico" utilizado como condimento; Hypochoeris meyeniana, la "achicoria" cuyas hojas se comen en ensalada; etc.

"Plantas medicinales: Los indígenas de la Puna utilizan empíricamente numerosas especies indígenas como remedio. He anotado como más comúnmente empleadas las siguientes: Pellaea nivea (topasaire), Ephedra div. sps. (pingo-pingo); Chenopodium graveolens var. bangii (arca-yuyo); Opuntia sochrensii (airampu)*; Mulinum famatinense (chuchicaña); Acantholippia hastulata (rica-rica)**; Lampaya castellani (lampaya); Satureja parvifolia (muña-muña)*** Haplopappus rigidus (bailabuena); Gnaphalium melanosphaeroides (uira-uira); Artemisia copa (copa-copa); Senecio graveolens (chachacoma), Perneria paposa (pupusa)****; Mutisia friesiana (chinchircoma colorado, romerillo), Perezia kesua (marancel) y otras.

"Las propiedades atribuídas a estas plantas son de lo más diversas, desde tónicas, cardíacas, digestivas o afrodisíacas; ¡hasta propiedades contra el mal de ojo! Pero aunque en el uso medicinal de estas especies y de muchas otras haya mucho de sugestión y de superstición, es indudable que la flora del Altiplano debe reservar todavía muchos recursos vegetales para la medicina.

"Plantas cultivadas

"En la región de la Puna, especialmente en el sector argentino, la agricultura es sumamente limitada y sólo se practica en pequeñas chacras dispersas en las quebradas húmedas, entre los 3400 y los 4000 metros de altura sobre el mar. En general las especies cultivadas por la población indígena son solamente cinco: la "quinoa", las "habas", el "maíz", la "papa" y la "alfalfa". La "quinoa" (Chenopodium quinoa) es un seudocereal originario de los Andes y cultivado, en escala cada vez más reducida, desde Colombia hasta el noroeste de la Argentina (Mintzer, 1933; Hunziker, 1943; Cardenas, 1944). Sus granos, lavados y descascarados, se utilizan en la alimentación, en forma de sopa o de harina; las hojas se comen como verdura cocida. Existen numerosas formas hortícolas. Las "habas" (Vicia faba) son originarias de Eurasia y se han aclimatado muy bien en el Altiplano. El "maíz" (Zea mays), también originario de los Andes, tiene muy poca importancia en la Puna, pues a causa de las bajas temperaturas sólo produce choclos diminutos, y eso en los años mejores. La "papa" (Solanum andigenum) es también de origen sudamericano y en la Puna sólo da pequeños tubérculos. En cuanto a la "alfalfa" (Medicago sativa) se cultiva para forraje.

"En algunas quebradas muy húmedas, con agua todo el año, como la de Sansana y la de Yavi, se ven también cultivos de trigo y hasta algún ejemplar de Salix babylonica y de Populus italica. También he observado en cultivo rosales y dalias.

Como manifesté en un trabajo anterior (Cabrera, 1948) las causas que determinan este atraso en la agricultura son la falta de agua durante parte del año, el verano muy corto y, sobre todo, la ignorancia y apatía de los pobladores de la Puna. En Alcarzoqui, cerca de San Antonio de los Cobres, a 4000 metros de altura, el señor Eduardo Guzmán (oriundo de Catamarca) ha conseguido cultivar con éxito trigo, cebada, avena y cebollas. En Mina Aguilar, sobre la ladera, a 4000 metros de altitud se cultivan numerosas especies útiles u ornamentales. Anoté un pino, dos o tres Cupressus y cuatro o cinco plantas bastante raquíticas de Salix babylonica. Hay también rosales y arbustos de Eleagnus. En los jardines, junto a las viviendas de los

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* Esta planta, a cuyas semillas se atribuyen propiedades febrífugas, se utiliza también como tinctórea. Ha sido estudiada químicamente por Herrero Ducloux y Albizzati (1926).

** Esta planta ha sido estudiada por Fester (1955).

*** Esta especie ha sido estudiada químicamente por varios autores (Fester 1955).

**** Especie estudiada químicamente por Zelada (1927).

empleados se cultivan Iris, Calendula officinalis, Viola tricolor, Lathyrus, Cosmos y Trifolium pratense; como césped se emplea Lolium multiflorum. En la huerta pude ver lechugas, rabanitos, cebollas, habas y otras especies. Como elemento ornamental indígena se cultiva el "cardón poco" (Trichocereus poco) de hermosas flores rojas.

"Creo que la selección de variedades precoces y microtérmicas y la difusión de nociones de agricultura entre los coyas, mejoraría considerablemente las condiciones económicas de la Puna, especialmente en la zona húmeda de la misma."

(CABRERA, A.L. 1957. La vegetación de la Puna Argentina. Revista de Investigaciones Agricolas, Tomo XI, No.4: 317 y 368-370)

84. Australia: Plant Introduction Section, Division of Plant Industry, C.S.I.R.O., Canberra.

The following publications have recently been received:-

Quarterly list of introductions No.52 (Inventory of plants introduced during the quarter ended 31st March 1958)
Quarterly list of introductions No.53 (Inventory of plants introduced during the quarter ended 30th June 1958)
Seed Exchange List (1958)
NEAL-SMITH, C.A. and ANDREW, W.D. 1958. The Evaluation of five introduced grasses in terms of plant survival, individual plant productivity and autumn regeneration. Journal of The Australian Institute of Agricultural Science, Vol.24, No.3, pp.229-236.

85. Australia: Expedition to Chile

Mr. E.T. Bailey, of the Plant Introduction Section, Division of Plant Industry, C.S.I.R.O., Australia, returned at the end of January 1959 from a four-month collecting mission to South America. Most of the time was spent in Central Chile, but brief visits were also made to Mexico, Argentina, Uruguay and Rio Grande do Sul, Brazil.

The major objective of the mission was the collection of indigenous pasture species, including particularly pasture legumes which might be suitable for trial in the winter rainfall regions of southern Australia. While the range of material available was limited by the fact that the native flora in many parts of Central Chile has been largely replaced by naturalized species, interesting collections were obtained in many genera, while in addition to the pasture species many plants of ornamental value were also obtained.

A preliminary group of the collections is as follows:-

	Genus	Samples	
Legumes:	Adesmia	29	
	Hosackia	13	
	Lathyrus	9	
	Medicago	29	
	Trifolium	42	
	Vicia	8	
	Miscellaneous	39	169
		c/f	169

Genus		Samples	
		b/f	169
Grasses:	Briza	6	
	Bromus	13	
	Hordeum	8	
	Melica	3	
	Nassella	14	
	Phalaris	6	
	Piptochaetium	17	
	Poa	7	
	Stipa	12	
	Trisetobromus	17	103
Miscellaneous			86
			358

In addition to the seed samples, particular attention was paid to the collection of nodules from the roots of the legumes. Cultures prepared from these will be used to secure effective nodulation of the plants when grown in Australia. Such nodules have been obtained particularly in the genera Adesmia, Desmodium, Psoralea, Stylosanthes and Trifolium.

In his collecting mission, Mr. Bailey received much assistance from the Rockefeller Foundation, Office of Special Studies in Chile, while Sr. Carlos Munoz, Botanist of the Ministry of Agriculture of Chile, was of great assistance in identifying specimens and guiding field trips.

Most of the collections will be grown initially at the Plant Introduction Station at Kelmscott in Western Australia, and seed should be available later for distribution to those interested. An annotated report on the collections is in preparation, and will be available on request to the Plant Introduction Section, Division of Plant Industry, C.S.I.R.O., Canberra, A.C.T.

86. Australia: Papua and New Guinea

Mr. G.P. Keleny, recently FAO Field Officer in Indonesia, has now returned to his post as Plant Introduction Officer of the Department of Agriculture, Stock and Fisheries, Port Moresby, Papua and New Guinea. The following is a summary of the plant introductions which have been made into this Territory from 1949/50 to 1957/58:-

Cereals:	Rice	492
	Maize	45
	Sorghum	11
	Millet	13
	Other	6
Pasture and Forage plants:		
	Pasture grasses	209
	Pasture legumes	75
	Cover and shade crops	107
	c/f	958

b/f 958

Oil crops:	Peanut	63
	Soybean	10
	Castor bean	11
	Sesame	28
	Coconut	10
	Pyrethrum	14
	Tung oil	4
	Oil palm	4
	Sunflower	6
	Other	13
Fibres:	Cotton	9
	Hibiscus sp.	46
	Phormium	1
	Manila hemp	15
	Jute	15
	Ramie	6
	Flax	11
	Other	8
Stimulants and spices:	Tea	3
	Coffee	22
	Tobacco	26
	Pepper	6
	Ginger	4
	Vanilla	3
	Capsicum	16
	Hops	11
	Other	13
Forest trees) Ornamentals)		440
Fruits		150
Vegetables		181
Rubber		58
Flowers		10
Miscellaneous		42
		2,217

Mr. Keleny has also sent a copy of his paper entitled "Plant Introduction Methods - Impressions gained during a visit to Fiji" (The Papua and New Guinea Agricultural Journal, Vol.9, No.1, July 1954; pp.13-16)

87. Japan: Expedition to Nepal

FAO has received from the Fauna and Flora Ressarch Institute (Institute of Humanistic Science, Kyoto University, Kyoto, Japan), the following three volumes published in 1955 and which refer to an expedition conducted by this Society in Nepal in 1952/53. The three volumes are edited by Professor H. Kihara.

Vol. 1: Fauna and Flora of Nepal Himalaya (390 pages)
" 2: Land and Crops of Nepal Himalaya (529 ")
" 3: Peoples of Nepal Himalaya. (425 ")

The volume of special interest with regard to plant introduction is No.2, which has the following contents:-

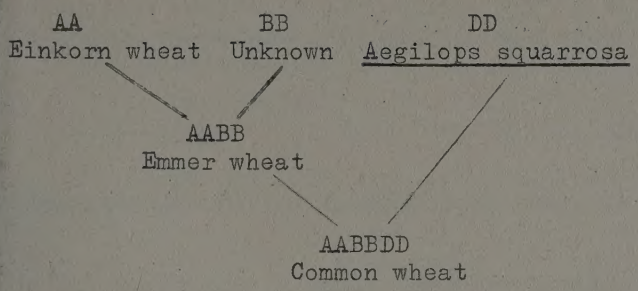
The articles dealing with the individual crops are written from the point of view of the possible value of the species, varieties and ecotypes for introduction into Japan.

88. Japan: Expedition to Near East

Using funds from a special grant from the Rockefeller Foundation, the Botanical Mission of the University of Kyoto, Japan, have sent an expedition to the eastern Mediterranean region from the middle of April to the beginning of July 1959. Professor K. Yamashita, Professor of Biology in the University of Kyoto, who is now responsible for the wheat projects promoted by H. Kihara, and his colleagues, will concern themselves primarily with wheat but also with other wild and cultivated plants. In addition to Professor Yamashita, the following are members of this Mission:-

Mr. Masatake Tanaka, Assistant Professor of Genetics
Mr. Osamu Suzuka, Lecturer of Cytogenetics
Mr. Seiji Nakamura, a cameraman

As an outcome of the cytological and genetical studies of Dr. Kihara, the former Professor of Genetics at the University of Kyoto, it is known that the genealogical relationship of wheat and its relatives is as follows:-



Annotation:
A, B or D represents the symbol of the genome which is the cytological and genetical unit of making up each species.

The wild species Aegilops squarrosa occurs from Pakistan to Iran through Afghanistan, and it is thought that our common wheat, AABBDD, arose by hybridization between emmer wheat and Aegilops species in these regions. Similarly, it is presumed that emmer wheat originated from a cross between Einkorn wheat, an existing diploid species, and another species still unknown with BB constitution. Recent studies in Japan have led to the conclusion that BB species may belong to the Section Sitopsis of the genus Aegilops. It is known that this and many other species occur in and around the eastern Mediterranean. The countries to be visited by this Japanese expedition are:-

United Arab Republic (Southern Region), Libya, Lebanon, United Arab Republic (Northern Region), Jordan, Turkey, Greece, Italy, Afghanistan and India.

The Mission is equipped with a Jeep provided by the Mitsubishi Heavy Industries Co.Ltd., Reorganized, Japan.

The work on wheat carried out by Professor A. Yamashita and his colleagues in the Biological Laboratory at the Kyoto University is dealt with in a publication entitled "Wheat Information Service", obtainable direct from that Laboratory.

89. South Pacific Commission: Plant Collection and Introduction

Following upon Item No.31, the information quoted below is from the Proceedings of the 18th Session of the South Pacific Commission, Noumea, 26 September/12 October 1958:-

The Commission's programme includes the collection and testing of a specific range of economic plants within the Pacific Islands area for distribution and exchange among the territories, as well as distribution of plants from other areas. Special attention has been given to coffee, cocoa, root and green vegetables, breadfruit, pepper, bamboo, other possible cash crops, and forage and pasture plants. Also included are field surveys of economic plants, special studies of plants of particular importance to the economy of the islands, and dissemination of information to the territories. The Plant Introduction Officer (Dr. Jacques Barrau) is now engaged on a special study of the breadfruit. A technical committee of specialists advises the Commission on plant introduction.

Since 1957, 112 species and varieties of economic plants have been distributed to territories through the Commission's plant introduction service. Close co-operation has been maintained with the Nadururloulou Plant Introduction and Quarantine Station in Fiji, to whose support the Commission provides financial assistance.

Emphasis has been placed on visits to the territories to ensure co-operation between the Commission and the territories and to keep the Commission informed of territorial needs. Requests for plant material from the territories are increasing steadily.

Resolution 20. The Commission:

(a) Expresses satisfaction with the progress of the plant introduction programme, and agrees to its continuation;

(b) Agrees to the appointment of an assistant to the Plant Introduction Officer to enable close contact to be maintained with territories and to meet their increasing demands for the service:

(c) Approves the enlargement of the list of plants for attention by the addition of legumes suitable as cover crops and cereals (maize, rice and sorghum), for which requests are frequently received;

(d) Notes with interest the revised programme of the Naduruloulou Plant Introduction and Quarantine Station, and approves the continuation of the grant of £1,000 to the Station during 1959; and

(e) Notes that the projected study of bamboo to be undertaken in collaboration with the Maria Moors Cabot Foundation is expected to commence during 1959.

90. South Pacific Commission: Reconnaissance survey in the field of economic botany in Western Melanesia

The Plant Introduction Officer of the Commission, Dr. Jacques Barrau, left Noumea, New Caledonia, on 31 January 1958, to visit parts of the Western Melanesian territories (Netherlands New Guinea, the Territory of Papua and New Guinea and the British Solomon Islands Protectorate), for the following purposes:-

(a) To keep an up-to-date inventory of the region's economic plants by species, and a running inventory of new introductions and newly released selections;

(b) To ensure the liaison between the main introduction and quarantine stations;

(c) To study the problems:

(i) encountered in the field of plant quarantine in connection with plant introduction;

(ii) related to transport, propagation and distribution of plant material.

He returned to Noumea on 23 April. The following is an adaptation of the summary, general conclusions and recommendations from a mimeographed report:-

In the field of plant collection and introduction, Western Melanesian territories, particularly New Guinea, are of the utmost importance. This fact is due to:

(a) the large amount of plants which have been introduced there during the European era;

(b) the numerous economic plants included in the native and pre-European introduced floras;

(c) the several species growing there which could be the subject of more complete plant collection work or economic botany studies; e.g. Artocarpus spp., Barringtonia with edible kernels, Canarium spp., Ipomoea batatas, Metroxylon spp., Musa spp., Psophocarpus tetragonolobus, etc.

The plant introduction activities of the South Pacific Commission have proved useful to the territories visited, as shown by the requests received from the Departments of Agriculture. New Guinea, particularly the Territory of Papua and New Guinea, is an important and safe source of plant material for other territories within the South Pacific Commission area. In the territories where plant introduction has been most active since the last war (Netherlands New Guinea, the Territory of Papua and New Guinea), great care has been taken to prevent the introduction and spreading of plant pests and diseases: introduction through quarantine stages in Wageningen University, Holland, in the case of Netherlands New Guinea, and the very strict quarantine policy in the case of the Territory of Papua and New Guinea.

Dr. Barrau strongly recommends that this very strict policy applied by the Territory of Papua and New Guinea be taken as a model in the South Pacific Commission's area. This policy can be summarized as follows:

(a) Plant introduction is made only when absolutely necessary and only when the plant material introduced is immediately needed for an experiment or a crop development scheme.

(b) In all cases, extremely strict quarantine measures are taken, including stages in a very good local plant introduction and quarantine station, isolated in a non-farming area, and frequently visited by entomologists and phytopathologists of the Department of Agriculture.